

REMARKS

This application has been carefully reviewed in light of the Office Action dated October 31, 2007. Claims 11-20 are now presented for examination. Claims 11, 19 and 20, the independent claims, have been amended to define still more clearly what Applicant regards as his invention. Favorable reconsideration is respectfully requested.

In the outstanding Office Action, Claims 11, 12, 14 and 18-20 were rejected under 35 U.S.C. § 103(a) as being obvious from U.S. Patent Application Publication 2002-0122194 A1 (Kuwata et al.) in view of U.S. Patent 6,774,953 (Champion et al.). In addition, Claim 13 was rejected as being obvious from *Kuwata* in view of *Champion* and U.S. Patent 6,198,553 (Yamamoto et al.), Claim 15, as being obvious from *Kuwata* in view of *Champion* and U.S. Patent 6,975,437 (Takemoto), and Claims 16 and 17, as being obvious from *Kuwata* in view of *Champion* and U.S. Patent 6,629,107 (Ouchi et al.).

As shown above, Applicant has made a number of changes to the claim language. First, the amendment “wherein, in a case where it is determined that the input image data represents the image of the person as the subject of the image, the [second] first color space conversion condition is selected” in Claims 11, 19 and 20 is merely to correct an inadvertent misdescription in the previously-presented claim language. The corrected language is clearly supported by, for example, S603 in Fig. 6.^{1/}

In addition, Applicant has made an effort to clarify the language of the claims, by means of adding the explicit statement that “the number of bits of the image data converted by using the first color space conversion condition is the same as the

^{1/} It is of course to be understood that the claim scope is not limited by the details of this or any other particular embodiment that may be referred to.

number of bits of the image data converted by using the second color space conversion condition”. This feature is clearly supported by, for example, S504 and S507 in Fig. 5 (where data is converted into eight-bit data).

If the number of bits remains the same, the quality of the gradation deteriorates if a wider gamut is expressed. That is, if the number of bits is same, a trade-off relation is established between the gamut to be expressed and the gradation quality.

Since human sight is very sensitive to gradation in image portions that show human skin, it is necessary to attach great importance to gradation quality when handling an image of a person. Consequently, the method of Claim 11 involves selecting a first color space conversion condition for an image that contains a person. According to this method, it is possible automatically to select the color space conversion condition suitable for an image of a person.

Applicant believes that Claim 11 is allowable over the prior art because of the feature set out in the added language, but also believes that that claim is allowable over the prior art because of features already recited in the claim, namely the determining step and the selecting step, which Applicant does not agree are taught or suggested by the art.

The Office Action states, and Applicant agrees, that *Kuwata* does not disclose the determining step, and does not disclose making a particular selection in a case where the result of the determination is that the image is an image of a person. The Examiner cites *Champion* for those features, but Applicant strongly disagrees, for the following reasons.

The Examiner appears to understand the *Champion* apparatus as determining whether an image being processed contains flesh tones, and if so, then

selecting a color-warping process that is said to be suitable for such image content.

Applicant has carefully studied that patent, and strongly believes that the Examiner has misapprehended the disclosure thereof. Applicant believes that the *Champion* apparatus, in fact, does not make any determination as to the presence or absence of flesh tones, and also does not make a selection among processings based on the presence or absence of flesh tones.

In the portion of *Champion* identified in the Office Action as being relevant to these features, *Champion* does state that certain shades, including the shades of white and flesh tones, are especially apt to suffer degradation in quality if displayed using a laser light system, because standard video content is intended for display on a CRT, a system that has a much more restricted color range (gamut). *Champion* states:

“The range (gamut) of colors available in a laser projection system is much larger than for traditional CRT displays. However, most video content is intended for display using traditional CRT displays, which have a limited color gamut (defined by ITU Rec. BT709). *If this video content were directly displayed on a laser light system, the colors, particularly the shades of white and flesh tones, would be incorrect and would degrade the viewing experience. This video content is therefore transformed (morphed) in color warping block 122.* A conventional linear transformation scheme (discussed below with reference to FIG. 2) will map the colors correctly, but will not utilize the extended color gamut available with laser light. The transformation scheme of the current invention enables the extended color gamut to be used. The outputs from color warping block 122 are R'G'B' signals corrected for use with the laser projection system. The present invention is primarily concerned with the operation of this block, so it will be discussed in more detail below. The R'G'B' signals are passed to laser display 124. The laser display may perform further processing of the video signal to compensate for the spatial characteristics of the display system, such as image scaling and lens aberration. [Emphasis added]” Col. 4, lines 21-43.

Thus, *Champion* does note the particular susceptibility of shades of white and of flesh tones to quality problems if displayed without suitable processing on a laser light system,

and does note that a color warping block 122 is provided to address this problem.

Applicant cannot find anything in this passage, however, that in any way suggests that the *Champion* apparatus is examining an image to determine whether the image contains the mentioned white shades or flesh tones, as the Office Action asserts.

Moreover, a careful consideration of the following portions of *Champion* makes clear that no such determination is made by the *Champion* apparatus, and that application of the color warping is not based on the result of any such determination. *Champion* describes the need for a non-linear transformation for white shades and flesh tones, and the conventional approach of using a look-up table to avoid the need for extensive calculations:

“In the conventional color transformation scheme, described above with reference to FIG. 2, the transformation between the pre-gamma RGB signals is linear and is applied using a matrix multiplication. Since the gamma modified signals are effectively compressed, the pre-gamma RGB signals must be stored at a higher precision than the R'G'B' signals. This increases the amount of computation required to perform the matrix multiplication. *In order to make use of the extended color gamut of a laser projection system, and to match the correct white point and flesh tones, a non-linear transformation is required.* The transformation may be accomplished by use of a look-up table, but to store all combinations for 8-bit encoded colors would require 2^{24} memory locations each holding 24 bits of information, i.e. 48 MB of memory. This size of memory is impractical. Accordingly, the present invention provides a transformation scheme that requires considerably less memory than a lookup table alone, but also requires much less computation than a non-linear mapping of the color space. [Emphasis added]” Col. 5, lines 24-42.

Champion goes on to describe an approach, in which the size of the look-up table is greatly reduced, so that it can be addressed using only the five most significant bits of the signal values as addresses, and then using the three least significant bits to compute a correction to the approximate values output by the look-up table. (Col. 5, line 43, through

col. 6, line 6; a more detailed description of the correction processing is at col. 6, line 7, through col. 7, line 70.)

The Examiner appears to be taking this description as meaning that the *Champion* apparatus determines whether an image contains flesh tones and, if the result of the determination is affirmative, subjects the image to processing using the color warping block 122. Applicant, however, can find in no suggestion that that is correct. As Applicant understands that patent, any image is subjected to the same steps of processing. If the image has a region containing white shades or flesh tones, then the look-up table and correction processing described at cols. 5 - 7 performs the mentioned non-linear transformation on the image data for the pixels containing such shades or tones. This is not the result of a decision or determination, however, but occurs as a matter of course, the non-linearity of the processing being built in to the values stored in the look-up table. The video signals for all pixels of the image, that is, receive the same treatment. All are subjected to color conversion performed by using the same primary look-up table and a 3 x 3 matrix calculator (Fig. 3).

In other words, as Applicant reads *Champion*, the video signals representing an image that is to be processed are all receive the same treatment as far as concerns the color warping block 122: as shown in Fig. 1 of *Champion*, the sequence of processing includes treatment by block 122 for all types signals. Nothing has been found, or pointed out, in that figure or elsewhere in *Champion* that in any way suggests that a determination is made as to the presence of white shades or flesh tones in image data, or that the content of the image processing for that image data is selected on the basis of the result of such a determination. White shades and flesh tones are subjected to a non-linear transformation

that permits effective use of the laser-light display gamut simply by the proper construction of the look-up table.

Applicant also submits that nothing has been found in *Champion* that would teach or suggest that plural color space conversion conditions for respectively performing conversion to different color gamut are provided. Still less does anything in that patent appear to teach or suggest that a trade-off is made between gradation quality and gamut of expression, as in the method of Claim 11.

For all these reasons, Applicant submits that even if *Kuwata* and *Champion* are combined in the manner proposed in the Office Action, and assuming for purposes of argument that such combination would be a proper one, the result would not teach or suggest either the determining step of Claim 11, or the step of making a selection of color conversion condition based on the result of such a determination. Therefore, Applicant submits that Claim 11 is allowable over those patents.

Independent Claims 19 and 20 are apparatus and computer-readable medium claims, respectively, corresponding to method Claim 1, and are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

A review of the other art of record has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from independent Claim 11, and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however,

the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and allowance of the present application.

Applicant's undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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